

Case Report

MONOARTICULAR SYNOVITIS OF KNEE DUE TO UNRECOGNISED INTRA-ARTICULAR PLANT SPLINTER

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Abstract:

Synovitis of a knee secondary to penetrating splinter injuries of plant origin aren't frequently reported. Historically, it is considered aseptic and treated with removal of the intraarticular foreign body and affected synovial lining.

We report a case of a 59-year-old healthy man whose left knee was injured while at work at a bamboo plantation site. He presented to us with pain and swelling of the knee for one month. He underwent diagnostic arthroscopy of the knee wherein a foreign body was identified, located and removed and near total synovectomy was done.

We present this patient's case and its management with a review of the relevant literature.

Keywords : Synovitis, plant splinter, knee swelling, arthroscopy, foreign body

Introduction:

Monoarticular synovitis of knee secondary to penetrating splinter injuries of plant origin are rare but a well described entity which is usually under-recognised.^{1,2,3} This is apparently is due to the trivial nature of trauma and a very insidious onset of symptoms. The effusion may be sterile and is due to the irritation of the foreign body to the synovial tissue^{3, 4} but occasionally organisms may be isolated.⁵

Radiographs may be negative and MRI may show synovitis without a specific pathology.⁶

Arthroscopy is the most important diagnostic and therapeutic procedure along with radiographic examination in a case of suspicious history and clinical features.⁷

when accidentally his sickle cut a wound over the anterior aspect of the knee one month ago. The wound had healed within two weeks without any complications but the knee pain and swelling which gradually progressed with disturbing his daily activities and sleep. He complained of throbbing type of pain, which was not relieved with analgesics and rest. He had no history of fever or chills or any other joint involvement.

He was clinically assessed and effusion was noted at the knee joint (Figure 1), with a fixed flexion deformity and terminally painful range of motion with local rise in temperature. The routine haematological evaluation was normal (total count: 9200, CRP: Negative) and no infectious pathology could be recognised.

X-ray was within normal limits with early features of osteoarthritis. MRI images showed significant effusion in the knee. Diagnostic arthroscopy of the left knee was performed under spinal anaesthesia. There was pale yellow colour clear synovial fluid about 120ml which was drained and sent for evaluation (Figure 2). Synovial tissue was inflamed with features of unhealthy fimbriae. A brown coloured 3-4 mm long slender foreign body was identified

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A 59 year old gentleman presented to us with alleged history of penetrating trauma at a bamboo plantation site

in the medial joint space overlying the meniscus (Figure 3) and was extracted (Figure 4). No other foreign bodies were recognised on probing the joint. Near total synovectomy of the knee was done.

Closure of the surgical site was done.

The synovial fluid analysis revealed, normal sugar and proteins. The culture reported no growth in the fluid sample. Intravenous antibiotics were stopped at five doses.

Knee exercises were started immediate post op and full range of motion was attained in two months and the operated knee appeared normal like the contralateral knee on review (Figure 5).



Figure 3: 3-4 mm long slender foreign body identified in the medial joint space overlying the meniscus.



Figure 1: Left knee showing suprapatellar and parapatellar effusion.



Figure 4: 4 mm long slender foreign body after removal from the knee.



Figure 2: Pale yellow synovial fluid drained from the knee.



Figure 5: At 6 weeks post-op the operated knee appears normal just like the contralateral knee

Discussion and Review of Literature:

Arthritis caused by plant thorn penetration is well known, especially among children. Blackthorn or date palm thorns caused synovitis is reported in most cases⁸, but it can occur from thorns of several kind of plants^{9,10,11}. The most commonly affected joint is the knee, but similar processes

have been described in the hand, ankle, and wrist^{9,10,12,13}.

Historically, failure to discover an organism in the joint fluid after a plant thorn injury led to the hypothesis, first published in 1953, that the synovitis after these injuries was an aseptic inflammatory reaction provoked by alkaloid compounds in the vegetable matter¹⁴. This disease at that

time was known as “blackthorn inflammation”¹⁵.

It was not until 1977 that the first positive culture specimen of synovial fluid after plant thorn injury was reported with growth of *Staphylococcus albus*, *Streptococcus hemolyticus*, and Gram-negative rods¹⁶. Joint infection caused by *Pantoea* agglomerans was first reported in 1978¹⁷.

In earlier reports, treatment consisted of arthrotomy and removal of all thorn fragments^{14,15,16}. In 1980, the advantages of arthroscopy became clear¹⁸. Arthroscopy may allow complete observation of the joint and extraction of the foreign body, but there still are several pitfalls. Plant fragments usually are too small to be seen and a reactive hypertrophic plica can obscure the presence of an intraarticular foreign body and may be missed by the

operating surgeon⁷. This led to the recommendation to remove all the macroscopically abnormal synovial lining. In most instances, this will involve complete synovectomy or recurrence of symptoms is possible^{17,10,16,19}. O'Connell RL, Fageir MM, Addison A reported a case of synovitis of the knee due to trauma by a splinter of wood and also removal of the splinter by mini-arthrotomy²⁰. Díaz-Martín AA et al; reported a case of arthroscopic removal of a projectile from the knee after a gunshot wound to the knee.²¹ Joris F. H. Duerinckx reported a case of subacute synovitis of knee after a rose thorn injury²². Muschol M, Drescher W, Petersen W, Hassenpflug J published on 'Monoarthritis of the pediatric knee joint: differential diagnosis after a thorn injury.' Wherein the misdiagnosis of a foreign body of knee was made as monoarthritis and arthroscopic removal of the foreign body was done after confirming the diagnosis⁷.

References:

- Cahill N, King JD. Palm thorn synovitis. *J Pediatr Orthop.* 1984;4:175–179.
- Cracchiolo A, Goldberg L. Local and systemic reactions to puncture injuries by the sea urchin spine and the date palm thorn. *Arthritis Rheum.* 1977;20:1206–1212.
- Karshner RG, Hanafee W. Palm thorns as a cause of joint effusion in 17 children. *Radiology.* 1953;60:592–595.
- Kelly JJ. Blackthorn inflammation. *J Bone Joint Surg Br.* 1966;48:474–477.
- Sugarman M, Stobie DG, Quismorio FP, Terry R, Hanson V. Plant thorn synovitis. *Arthritis Rheum.* 1977;20:1125–1128.
- Said HG, Masoud MA, Yousef HA, Imam HM. Multidetector CT for thorn (wooden) foreign bodies of the knee. *Knee Surg Sports Traumatol Arthrosc.* 2011 May;19(5):823-5.
- Muschol M
- , Drescher W, Petersen W, Hassenpflug J. Monoarthritis of the pediatric knee joint: differential diagnosis after a thorn injury. *Arthroscopy.* 2004 Oct;20(8):865-8.
- Kratz A, Greenberg D. *Pantoea* agglomerans as a cause of septic arthritis after palm tree thorn injury: case report and literature review. *Arch Dis Child.* 2003;88:542–544.
- Miller EB, Gilad A, Schattner A. Cactus thorn arthritis: case report and review of the literature. *Clin Rheumatol.* 2000;19:490–491.
- Oleingski TP, Bush DC, Harrington TM. Plant thorn synovitis: an uncommon cause on monoarthritis. *Semin Arthritis Rheum.* 1991;21:40–46.
- Zoltan JD. Cactus thorn synovitis. *Arthroscopy.* 1991;7:244–245.
- Blake DR, Bacon PA, Scott CA, Potter AR. Monoarthritis from blackthorn injury: a novel means of diagnosis. *Br Med J (Clin Res Ed).* 1981;282:361–362.
- Freiberg AA, Herzenberg JE, Sangeorzan JA. Thorn synovitis of the knee joint with *Nocardia* pyarthrosis. *Clin Orthop Relat Res.* 1993;287:233–236.
- Karshner RG, Hanafee W. Palm thorns as a cause of joint effusion in 17 children. *Radiology.* 1953;60:592–595.
- Kelly JJ. Blackthorn inflammation. *J Bone Joint Surg Br.* 1966;48:474–477.
- Sugarman M, Stobie DG, Quismorio FP, Terry R, Hanson V. Plant thorn synovitis. *Arthritis Rheum.* 1977;20:1125–1128.
- Flatauer FE, Khan MA. Septic arthritis caused by *Enterobacter* agglomerans. *Arch Intern Med.* 1978;138:788.
- Carandell M, Roig D, Benasco C. Plant thorn synovitis. *J Rheumatol.* 1980;7:567–569.
- Doig SG, Cole WG. Plant thorn synovitis, resolution following total synovectomy. *J Bone Joint Surg Br.* 1990;72:514–515.
- O'Connell RL, Fageir MM, Addison A. Be aware of wood in the knee. *BMJ Case Rep.* 2011 Dec 13;2011.
- Díaz-Martín AA, Guerrero-Moyano N, Salinas-Sánchez P, Guerado-Parra E. [Arthroscopic removal of an intraarticular projectile from the knee]. *Acta Ortop Mex.* 2011 Jul-Aug;25(4):223-6.